

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of)	
)	
Federal Communications Commission)	WT Docket No. 05-157
Requests Comment On Spectrum Needs)	FCC 05-80
Of Emergency Response Providers)	
)	
)	
To: The Commission		

COMMENTS OF THE MISSOURI STATE HIGHWAY PATROL

I Introduction

1. The Missouri State Highway Patrol hereby submits the following comments in response to the *Public Notice*, FCC 05-80, released March 29, 2005 in which the Commission seeks input and comment on the spectrum needs of public safety emergency response providers related to Section 7502 of the Intelligence Reform and Terrorism Prevention Act of 2004.

2. The Missouri State Highway Patrol (MSHP) is the primary statewide law enforcement agency within the State of Missouri, with responsibility covering an area of over 69,000 square miles. With 114 counties and the City of St Louis, Missouri, like many other states, is extremely diverse with regard to its public safety spectrum requirements due to both topography and demographics, with more than 60 percent of its citizen's residing in just ten (10) of its 115 county-like entities. In addition, the mineral content of southern Missouri's terrain creates difficulties in the development of radio systems providing adequate coverage to meet the needs of the first responder

community in any public safety radio band. Missouri's diverse population centers provide unique challenges to agencies attempting to develop public safety radio systems with sufficient radio coverage in any band over 150 MHz. Due to these disparities, meeting public safety communications needs and the development of interoperability between first responders in urban, suburban, and rural areas of Missouri has been achieved almost exclusively within the FCC's public safety allocations located in VHF High Band (150 MHz).

3. The Missouri State Highway Patrol currently utilizes FCC public safety allocations located in the VHF Low Band portion of the radio spectrum to meet the communication needs of the agency and provide statewide voice service to units in the field. The MSHP has utilized FCC designated VHF Low Band channels since the Federal Communications Commission designated 42 MHz channels for state police use within the scope of a National State Police Geographic Channel Plan. While the propagation characteristics of this band are favorable for wide area radio coverage, those same characteristics, along with a limited number of available channels in the band, make the introduction and deployment of new technologies into the band (such as trunked radio systems) difficult. In addition, the recent Broadband Over Power Line proceeding and subsequent decision (FCC Docket 04-37) may create an environment creating additional interference potential to the existing heightened noise floor in the 42 MHz band, particularly for wide area operations where mobile units operate in rural areas within proximity of utility provider infrastructure. The quality of communications to a lone mobile unit in this band patrolling a stretch of highway located parallel to utility power lines providing BPL service to a rural community may be subject to an increased degree of interference resulting from the deployment of this new technology. The MSHP feels that in excluding BPL operations from utilizing certain existing frequency bands deemed critical between 2 and 80 MHz due to the potential interference resulting from the technology, the Commission should have also added public safety channels in VHF Low Band to the list of protected channels.

4. Finally, the Missouri State Highway Patrol has been involved in regulatory activities with regard to state and local public safety spectrum management for several years, with representation in national associations and federal advisory committees such as the National Public Safety Telecommunications Council and the National Coordination Committee, which developed the usage criteria for the 700 MHz public safety spectrum. In addition, the MSHP sponsors the Association of Public Safety Communications Officials Automated Frequency Coordination Local Advisor for Missouri, who assists local Missouri agencies with FCC licensing, spectrum management and frequency coordination. The MSHP also supports regional planning resources for Region 24 (Missouri) 700 and 800 MHz regional planning committees. The MSHP feels several initiatives, if undertaken by the Commission with representation from the public safety community's representatives in the field, can contribute long and short-term improvements to the current public safety communications environment. These initiatives must take into account the nature of the nation's population centers, fiscal local government realities associated with funding disparate public safety requirements, and the need for communications operability, along with inter-agency interoperability, to provide the best communications mechanism to secure the Homeland.

5. Based on the experience of the MSHP, and its knowledge of the challenges currently facing states, county, and local governments with regard to spectrum management, Missouri is an example of a state where successful state and local communications solutions will result from cooperative regional efforts utilizing multiple non-proprietary communications solutions in established bands. A strategy that associates the use of particular public safety frequency allocations in areas where those bands are most effective in meeting capacity, coverage, and regional interoperability will be needed. In the absence of a strategy to work within, people build systems on public safety allocations they can acquire, rather than those bands best suited for their jurisdiction, coverage requirements and compatibility with regional interoperability mechanisms. Use of particular public safety frequency allocations, developed in concert with a regions identified needs and requirements, is required to ensure that regional

interoperability can be achieved. A single solution is rarely the answer to addressing wide area public safety communications needs within a region. More often than not, public safety solutions can be achieved by participation of representatives from a region convening in an inclusive forum, similar to a State Interoperability Executive Committee, and sharing their agencies needs with representatives from the region. This dialogue provides two necessary elements: It can lead to regional solutions effectively utilizing existing resources and also make agencies more aware of the needs of the multiple agencies and disciplines within their first responder community at all levels of government.

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II FUTURE SPECTRUM NEEDS OF THE FIRST RESPONDER COMMUNITY

VHF High Band Public Safety Channel Expansion with some form of structure introduced to the 150-174 MHz Band

6. The VHF High Band public safety spectrum allocation (portions of 150-160 MHz) is in need of structure to maximize the potential of this already allocated band. The maturity of the band, combined with the inconsistencies in its deployment, leads to an inefficient use of the band. This band is the most widely used state and local public safety frequency allocation in the nation and offers both favorable noise characteristics along with propagation characteristics conducive to effectively covering wide areas. In particular, achieving wide area coverage at a minimum infrastructure cost is a public safety need found in many rural areas of the country. The VHF High Band, unlike both shared and exclusive FCC assigned spectrum in the UHF portion of the spectrum (450-470 MHz, 700 and 800 MHz), has neither assigned channel pairs nor established loading criteria to ensure channels are utilized in an efficient and effective manner. In addition, the recent FCC narrowband ruling (FCC 99-87) has provided public safety a roadmap with an identified endpoint, in which a large number of existing licensees will have to reduce the bandwidth of their current radio systems, with the end result consisting of VHF deployment with existing equipment being replaced or reprogrammed.

7. The Commission's decision and time frame established in the re-banding Docket, done in the best interest of public safety communications, offers the national public safety community a one time opportunity to re-organize the VHF band in a manner that can create greater channel reuse, improved spectrum management and coordination potential, while providing a more effective end product derived from the existing spectrum resource. Due to widespread public safety use of VHF High Band, stability in the band is needed to maximize its potential and any introduction of structure to the current band configuration must contain two elements: The public safety end user community will need to be active participants in both determining methods of achieving the reconfiguration process and the dialogue of

difficulties public safety will face in the process *while continuing to provide service to the public*. While uncertain as to the methods, procedures and details that would need to be included to re-band public safety VHF High Band, there is little doubt that the existing allocation could be better utilized.

8. As a continuation of the dialogue which began in the Public Safety Wireless Advisory Committee (PSWAC) process and report, the MSHP recommends the Commission convene a public safety advisory committee to discuss and address solutions for this issue, as well as other public safety regulatory communications challenges currently before the public safety community.

9. In order for any VHF High Band restructuring to take place, “green space” or available additional spectrum in the VHF High band would need to be made available. This national effort should allow agencies to participate in, and contribute to, a process that creates a more effective re-banded VHF environment. This green space should be within the FCC’s 150-174 MHz allocations to continue to ensure sharing possibilities and compatibility with federal users operating in the band. This public safety “green space” can also come from adjacent bands, such as TV Channel 7 (174-180 MHz), existing channels in the VHF High Band currently assigned to business users, or a combination of both. The transfer of business allocated VHF High Band spectrum, on a national basis, may provide opportunities to expand the public safety VHF High Band allocation sufficient. It must be stressed that a thoughtful carefully planned process should be undertaken with the state and local public safety user community involved as partners in the process. Only in this fashion can the end users benefit from VHF High Band restructuring. Details certainly need to be developed with the user community in mind, but a nationwide initiative will be necessary to make the best use of the current spectrum resource.

10. Another opportunity to promote “green space” in the VHF High Band for public safety development and expansion is outlined in the ICOM Petition for Rulemaking, filed June 15, 2004, asking the FCC to reallocate unsold Part 22 Public Mobile Radio Service IMTS channels to

the Public Safety Services. This vacated spectrum and the increased channel availability in certain economic areas of the country would, under a structured FCC approved plan, allow the “green space” needed in the reorganization of the existing Public Safety VHF High spectrum. A plan to restructure VHF High Band, taking into consideration that the majority of public safety VHF High Band users will already be reprogramming/replacing their equipment within the next 6-8 years and coordinating their narrowband strategies in conjunction with the FCC designated public safety frequency coordinators, will allow for a more structured and effective VHF High Band environment for years to come.

11. It should be stressed that, absent a plan developed by the public safety user community and the FCC certified public safety frequency coordinators with Commission oversight, any addition of VHF High Band frequency spectrum to the existing public safety allocation to improve coordinated operations in the band will fail, as the lack of structure and development guidelines existing in the band will cause the fragmented use of the band to continue, as it does today. The public safety community needs to utilize this allocation more effectively and to do so requires more consistent regulatory oversight of the spectrum and its implementations to improve the effectiveness of the current allocation.

12. Currently, shared spectrum between federal users under NTIA and state and local public safety users under the FCC is hampered by historical regulatory observations within both frequency management bodies, the Commission and NTIA. Quite often, state and local agencies, along with federal users, desire to share resources, infrastructure and spectrum, to accomplish their mission. While each of these proposed state and local sharing ventures is unique to the agencies involved and the jurisdiction to be covered, in this post September 11 environment, sharing opportunities between these agencies should be encouraged and supported based on their individual merit. For the most part, state and local and federal agencies would not entertain sharing resources if both agencies did not find the partnership benefited their overall mission.

Statewide planning documents are needed to determine the current interoperable “landscape” and needs of each state, while through outreach, better educating first responders of the interoperable communications environment and potential in their state and region.

13. Today’s lack of intra-state and inter-state communications interoperability dialogue is responsible for, in large part, the lack of interoperability across the nations public safety community. The FCC has over the years designated nearly one hundred (100) public safety channels to further public safety communications interoperability in multiple radio bands within Part 90 of the FCC’s rules. Portions of these channels are designated for use *within a discipline*, and others are designated for *public safety operations* or to be used in a multi-discipline environment. If there was a repository for states and regions to post designated interoperability plans as they were developed, a *communications dialogue* between users of the FCC designated interoperability spectrum would lead to more efficient use of the interoperability channels, which could be documented and available the nations user communities.

14. To also promote public safety communications interoperability, standardized channel labeling/nomenclature could also be highlighted as a mechanism to promote a consistent national channel naming convention that can lead to a more consistent use of available interoperable resources in a multi-agency environment. State Interoperability Executive Committees, as defined by the National Coordination Committee under FCC Docket (86-86), can assist local and state entities with introducing and promoting consistent interoperable dialogue while providing a sounding board for the development of a interoperability requirements within a region or state while administering the FCC designated 700 MHz interoperability channels. While 700 MHz users are fortunate to potentially have a interoperability body endorsed by the FCC to administer public safety interoperability and provide guidance and direction to the user community in a specific region, the lack of the same oversight authority

with respect to those seeking similar interoperable results utilizing *bands other than 700 MHz that also contain FCC designated interoperability channels* is not consistent within the current public safety environment. The current environment does not allow users seeking interoperability within a region outside of the 700 MHz band the same opportunity as those in the 700 MHz band. With improved planning, and some oversight at the SIEC level to ensure inclusive participation within State Interoperability Executive Committees, interoperability can be improved in all bands while a new communications dialogue will be introduced to each state and region to benefit the public safety user community. A better way to utilize and manage the FCC designated interoperability channels, located in all public safety bands, is desperately needed. Different people define public safety communications interoperability in different areas in different ways. A national dialogue of practices proven to increase the interoperability quotient in a region, including documentation of channel nomenclature and the creation and support of state interoperable plans, can provide an increase in a regions interoperable potential while offering an alternative to the current interoperable environment.

15. To improve potential for interoperability nationwide, public safety needs more information on how neighboring agencies and their existing users define public safety communications interoperability and how they achieve it. Currently, there is no requirement for any agency to document any interoperable initiative. With no required inter-agency documentation on interoperability solutions between agencies, there is no mechanism for this dialogue to be created and supported. Without such an interoperable dialogue being introduced to the user community through outreach and education, the interoperability quotient of the nation's first responder's will rise to a ceiling defined by technical solutions, not regional dialogue and interaction. Technical solutions alone cannot raise the nations interoperability dialogue.

16. Through State Interoperability Executive Committees, which should be inclusive to all state, county and local agencies within a state or region and administered at the state level, the documentation of

interoperability and how it is defined and achieved in each state or region can be distributed to nearby agencies, improving interoperable awareness and effectiveness. These meetings are an excellent forum for regular, much needed regional interoperability discussions

III NEED FOR A NATIONWIDE MOBILE BROADBAND WIRELESS COMMUNICATIONS NETWORK

17. The Commission requests comment on the operation and administration of a nationwide mobile broadband network, possibly utilizing commercial technologies in portions of the 700 MHz band. It should be noted that “commercial technologies” do not necessarily have to be perceived as parallel in performance and capabilities as “commercial systems”. Commercial technologies will be utilized in many public safety applications, particularly in the new 4940-4990 MHz band, provided they are designed, implemented and *intended* to provide public safety coverage. To meet this end, public safety coverage requirements have to be considered in any design and implementation, which utilizes “commercial technologies”. The difference between commercial technologies being utilized in public safety grade systems compared to being used in “commercial systems” is in the system design and implementation. Those developing “commercial systems” primarily develop systems intended to meet a business oriented cost recovery model, rather than a ubiquitous jurisdiction wide coverage paradigm, a methodology which public safety historically utilizes.

18. It is unclear in the Notice if the FCC intends on *interoperability*, when describing attributes of such a network, to stem from subscriber to subscriber communications (used in a *direct* “off network” mode between subscribers) or from multiple users operating on a *network*, where users can benefit on the inherent interoperability or connectivity achieved while operating on a common infrastructure. In order to achieve the latter, the systems offering of complete, ubiquitous coverage within an area (as required by the resident public safety community and *as defined by the public safety community*) will have an immediate impact on interoperability. If relying on a network is the method of achieving interoperable data communications, then redundancy and

complete area coverage that meets the needs of the public safety community in a given area is paramount in the design of such a system. Utilizing 700 MHz allocations in the development of a public safety, homeland security, and critical infrastructure mobile broadband network is a positive step forward if the intention is to implement to meet the public safety user community's needs. Commercial technologies can be utilized in public safety communications, but only if *implemented* with public safety coverage requirements in mind. Again, commercial systems have historically been developed to obtain cost recovery, not to provide sufficient ubiquitous area wide public safety coverage. The difference in the design and implementation between commercial and public safety systems is substantial and cannot be overstated.

19. With recent technological advancements utilizing wider channel bandwidths to achieve broadband data rates, in the 700 MHz band and others, the Commission might consider the possibility of allowing Regional Planning Committees the ability, based on a region having an approved regional plan and documenting that wider bandwidth technology can better meet the particular regions need, of aggregating 700 MHz 50 KHz wideband data channels above the 150 KHz limit in channel bandwidth. While aggregating to greater channel bandwidth may reduce the number of channels available within a region for independent data systems, it may also improve the interoperability potential of the band and make the region more adaptable to newer, broadband technologies conducive to wide area coverage, such as 802.16 and 802.20. Since less channel availability at greater bandwidth per channel can mean more units from a greater number of agencies accessing higher data rates for their applications, and enjoying *interoperability* while operating on a common network platform, perhaps some regions data needs can be better met with this added flexibility. Fewer wideband channels utilized within the currently allocated 12 MHz may allow more users to band together on common regional networks, particularly in urban communities with a large number of smaller jurisdictions, to access broadband applications and achieve a level of functional interoperability while continuing to enjoy a greater intra-agency *operability*.

20. A lesser number of channels utilized in the 12 MHz currently allocated to public safety will, based on lesser channel availability, reduce the number of “stovepipe” agency based non interoperable data systems from being developed, while at the same time potentially improving region wide data interoperability.

21. Should the FCC’s definition of broadband data interoperability needs include subscriber unit to subscriber unit applications, the Commission should be aware that few such applications, beyond text messaging in some areas, have been defined to date. This differs from voice interoperability requirements, where public safety applications are established and requiring physical measures in a device to ensure interoperability are appropriate, based on established voice applications. Wide area data interoperability, between subscribers in the absence of a network, is not yet completely defined within public safety, however, conventional low bandwidth voice applications between subscribers have been utilized for some time. It is anticipated that, over time, effective applications will surface for interaction between users at mission critical incident scenes where infrastructure is limited or not available at all.

22. Recent on-scene broadband applications for public safety have come to light that can provide Incident Commanders an increase in critical information from users at the scene (real time oxygen levels from firefighters on a fire scene, remote access of valuable information from ongoing incident scenes, real time location information of first responders at mission critical incidents etc.) without needing to retain connectivity with a home network. The deployment of these “on site” new technologies and applications at these free standing, on scene networks will improve the safety of our first responders. In addition, these incident scenes require management techniques using structure common to NIMS and Incident Command, where end users are managed on-scene by supervisory personnel. The achievement of interoperability, using on-scene resources by personnel in both voice and data modes, will need supervision through some form of management mechanism to ensure and affirm the end-users public

safety role. The Commission should acknowledge that technological advances and standards, although often identified as an interoperable cure, cannot alone provide interoperability to public safety. Technology and standards can only assist end users in achieving interoperability *after* they have established a communications dialogue identifying the interoperable needs between the necessary entities.

23. In the event commercial providers implement a wireless broadband nationwide network, perhaps utilizing radio spectrum from the upper 700 MHz band, management of the network would be an important topic to be addressed. Assuming the design of a network would be to meet the public safety, homeland security and critical infrastructure communications communities needs, the price of such a network may be in the form of subscriber fees for each user based on use. An ongoing oversight committee that would work with the system developers and those maintaining the system could ensure that pricing of subscriber rates would not make network access unaffordable, thereby removing any interoperable potential the band could offer. Many front line public safety responders across the nation operate with limited budgets and the most basic of equipment and materials, let alone broadband access, without some form of subsidy or assistance. Such a national network could accommodate many users and could accelerate the development and deployment of public safety broadband application, but if costs of the system were prohibitive, or system coverage was inconsistent and not applicable for wide area communications similar to many of today's commercial systems, many first responders would not be able to access the broadband applications they will need.

24. In addition, exclusive use 700 MHz or 800 MHz public safety radio spectrum is not always best suited to providing coverage in rural parts of the country due to the lack of infrastructure. What is needed is a nationwide strategy that addresses diverse needs in a uniform manner. Areas best suited to developing public safety voice and data systems in high capacity, trunked UHF spectrum should be able to functionally merge with rural areas where VHF High Band is implemented and low speed data applications are prevalent due to the lack of available infrastructure.

25. Should such a broadband wireless network become a reality, the connectivity associated with the development of such a nationwide system may, in its extension to rural communities, provide a mechanism for the deployment of wide area public safety voice systems. Many rural communities have access to public safety UHF allocations, but are not able to develop systems in these bands due to the lack of existing connectivity. The same connectivity associated with bringing rural broadband access through a nationwide data system can provide much needed rural connectivity for mission critical public safety voice systems.

The MSHP thanks the Commission for seeking input on the important topics above. We anticipate further dialogue on these issues as we attempt to better secure our Nations homeland.

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